

**WHAT IS CLAIMED IS:**

1. An *in vitro* model for evaluating the effects on angiogenesis, which is prepared by culturing endothelial cells in a three-dimensional collagen fiber gel with a medium suitable for the tube formation of  
5 endothelial cells.
2. The model according to Claim 1, wherein the collagen is type I collagen.
3. The model according to Claim 1, wherein the three-dimensional collagen fiber gel is obtained by dissolving a dry collagen fiber  
10 in a solution at the temperature of 4 to 10 °C.
4. The model according to Claim 3, wherein the solution is an acetic acid solution.
5. The model according to Claim 1, wherein the endothelial cells is derived from mammals.
- 15 6. The model according to Claim 5, wherein the mammals is human.
7. The model according to Claim 1, wherein the medium comprises growth factors, such as vascular endothelial growth factor (VEGF), epigallocatechin gallate (EGCg), and tumor necrosis factor- $\alpha$   
20 (TNF- $\alpha$ ).
8. The model according to Claim 1, wherein the medium comprises alkaloid, such as 12-o-teradecanoyl phorbol 13-acetate (TPA).
9. The model according to Claim 1, wherein the medium comprises optionally a tumor cell culture broth.
- 25 10. An *in vitro* method for assaying angiogenic effects of a compound, which comprises the steps of:

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- (a) providing the model according to Claim 1;
- (b) culturing the models added with and without the compound to be assayed, respectively, for a time sufficient for the tube formation of endothelial cells in the collagen fiber gels of the models; and
- (c) observing the morphology of the collagen fiber gels of the models after the culturing of step (b);
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- (d) comparing the morphologic differences between the collagen fiber gels of the models added with the compound and those added without the compound; and determining the effect of the compound on angiogenesis by comparing the degrees of collapse of the collagen fiber gels of the models; wherein the compound is determined to have a stimulatory effect on angiogenesis in case the collapse of the collagen fiber gel of the model added with the compound is increased in
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- comparison with that added without the compound; in contrast, the compound is determined to have an inhibitory effect on angiogenesis in case the collapse of the collagen fiber gel of the model added with the compound is decreased in
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- comparison with that added without the compound.

11. The method according to Claim 10, wherein the collagen is type I collagen.

12. The method according to Claim 10, wherein the three-dimensional collagen fiber gel in the step (a) is obtained by dissolving a dry collagen fiber in a solution at the temperature of 4 to 10 °C.

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13. The method according to Claim 12, wherein the solution is an acetic acid solution.

14. The method according to Claim 10, wherein the endothelial cells in the step (a) is derived from mammals.

15. The method according to Claim 14, wherein the mammals is human.

5           16. The method according to Claim 10, wherein the medium comprises growth factors, such as vascular endothelial growth factor (VEGF), epigallocatechin gallate (EGCg), and tumor necrosis factor- $\alpha$  (TNF- $\alpha$ ).

10           17. The method according to Claim 10, wherein the medium comprises alkaloid, such as 12-o-teradecanoyl phorbol 13-acetate (TPA).

18. The model according to Claim 10, wherein the medium comprises optionally a tumor cell culture broth.

15           19. The model according to Claim 10, wherein the morphology of the three-dimensional collagen fiber gels in the step (c) is compared by measuring the thickness of the three-dimensional collagen fiber gels.

20. The method according to Claim 10, wherein the morphology of the three-dimensional collagen fiber gels in the step (c) is compared by an absorbance measurement.

20           21. The method according to Claim 20, wherein the absorbance measurement comprises the steps of:

(1) removing the medium of the models;

(2) staining the three-dimensional collagen fiber gels of the models with a dye; and

25           (3) quantifying and comparing the absorbance of the dye in the models.

22. The method according to Claim 21, wherein the dye is trypan blue.